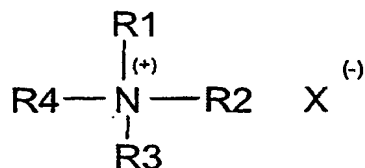


## Claims

1. An antibacterial additive for melamine resins, particularly for melamine-formaldehyde or  
 5 melamine/urea-formaldehyde resins, **characterized** in that it

- has at least one borate salt as active antibacterial compound, the borate salt being a salt of orthoboric acid  $H_3BO_3$  and/or metaboric acid  $HBO_2$  and/or  
 10 of polyboric acids  $H_{n-2}B_nO_{2n-1}$ , and
- has at least one quaternary ammonium compound of the formula



with  $R_1$ ,  $R_2$ ,  $R_3$  =  $C_1$ - $C_5$  alkyl,  $R_4$  =  $C_1$ - $C_{20}$  alkyl or  
 15 benzyl, it being possible for  $R_1$ ,  $R_2$ ,  $R_3$  and  $R_4$  to be identical or different, and X = chloride or bromide.

2. The antibacterial additive for melamine resins of claim 1, **characterized** in that the melamine resins are  
 20 formed by condensation of melamine or of mixtures of urea with melamine with aldehydes or mixtures of aldehydes such as, for example, formaldehyde, acet-  
 aldehyde, trimethylolacetaldehyde, acrolein, benzaldehyde, furfural, glyoxal, glutaraldehyde,  
 25 phthalaldehyde, terephthalaldehyde, isobutyraldehyde, acetone or ketones such as, for example, methyl ethyl ketone and diethyl ketone.

3. The antibacterial additive for melamine resins of claim 1 or 2, **characterized** in that the melamine resins are  
 30 etherified by reaction with  $C_1$ - $C_4$  alcohols and/or etherified and subsequently transesterified with  $C_4$ - $C_{18}$  alcohols and/or diols and/or

etherified and partly reacted with bisepoxides.

4. The antibacterial additive for melamine resins of any one of the preceding claims, **characterized** in that at least one borate salt can be described by the following formula

5  $M_a B_b O_c \cdot d H_2O$  and/or

$M_a N_a B_b O_c \cdot d H_2O$ , where

$a, a' = 1$  or  $2$

$b = 1$  to  $8$

$c = 1$  to  $13$

10  $d = 0$  to  $10$

$M, N = NH_4, Na, K, Li, Ca, Mg, Zn$ , and where

$M, N, a$  and  $a'$  may be identical or different.

5. The antibacterial additive of at least one of the  
15 aforementioned claims, **characterized** in that at least one borate salt is  $Na_2B_4O_7 \cdot dH_2O$  where  $d = 0, 5$  or  $10$ ;  $NaBO_2 \cdot dH_2O$  where  $d = 2$  or  $4$ ;  $NaB_5O_8 \cdot 5H_2O$ ;  $Na_2B_8O_{13} \cdot 4H_2O$ ;  $Ca_2B_6O_{11} \cdot 5H_2O$ ;  $NaCaB_5O_9 \cdot dH_2O$  where  $d = 5$  or  $8$ ;  $LiBO_2 \cdot 8H_2O$ ;  $LiB_5O_8 \cdot 5H_2O$ ;  $Li_2B_4O_7 \cdot 3H_2O$ ;  $K_2B_4O_7 \cdot 4H_2O$ ;  $KB_5O_8 \cdot 4H_2O$ ;  
20  $NH_4B_5O_8 \cdot 4H_2O$ ;  $(NH_4)_2B_4O_7 \cdot 4H_2O \cdot 4H_2O$ ;  $Zn_2B_6O_{11} \cdot dH_2O$  where  $d = 3.5, 7-7.5, 9$  and/or  $ZnB_2O_4 \cdot 2H_2O$ .

6. The antibacterial additive of at least one of the preceding claims, **characterized** in that at least one  
25 borate salt is technical zinc borate  $ZnO \cdot B_2O_3 \cdot dH_2O$  with  $\geq 45\%$  by weight  $ZnO$  and  $\geq 36\%$  by weight  $B_2O_3$  or technical sodium borate  $Na_2O \cdot B_2O_3 \cdot 10 H_2O$ .

7. The antibacterial additive of at least one of the  
30 preceding claims, **characterized** in that as sole borate salt it has technical zinc borate  $ZnO \cdot B_2O_3 \cdot dH_2O$ .

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8. The antibacterial additive of at least one of claims 6 and 7, **characterized** in that the amount of borate salt is 0.1% to 3% by weight, based on the amount of solid melamine resin.

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9. The antibacterial additive of at least one of claims 6 and 7, **characterized** in that the amount of borate salt is 1% to 2.5% by weight, based on the amount of solid melamine resin.

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10. The antibacterial additive of at least one of claims 6 and 7, **characterized** in that the amount of borate salt is 1.8% to 2.2% by weight, based on the amount of solid melamine resin.

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11. The antibacterial additive of at least one of the preceding claims, **characterized** in that at least one quaternary ammonium compound is benzalkonium chloride.

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12. The antibacterial additive of claim 11, **characterized** in that it has technical zinc borate  $\text{ZnO} * \text{B}_2\text{O}_3 * d\text{H}_2\text{O}$  and/or technical sodium borate  $\text{Na}_2\text{O} * \text{B}_2\text{O}_3 * d\text{H}_2\text{O}$  with  $d = 10$  and benzalkonium chloride in a weight ratio of 2:2:1.

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13. The antibacterial additive of claim 12, **characterized** in that the amount of technical zinc borate and/or technical sodium borate and benzalkonium chloride is 0.1% to 1% by weight, based on the amount of solid melamine resin.

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14. The antibacterial additive of claim 12, **characterized** in that the amount of technical zinc borate and/or technical sodium borate and benzalkonium chloride is 0.2% to 0.6% by weight, based on the amount of solid melamine resin.

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15. An antibacterial melamine resin comprising an antibacterial additive of at least one of the preceding claims.

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16. A process for producing an antibacterial melamine resin of claim 15, **characterized** in that an antibacterial additive of any one of claims 1 to 14 is mixed with a melamine resin present in dissolved form, the additive being admixed to the melamine resin in solid and/or liquid form to give an antibacterial melamine resin in suspended form which subsequently, directly or following conversion into a solid resin, is processed further at a later point in time.

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17. The process of claim 16, **characterized** in that the antibacterial additive is admixed during the melamine resin synthesis after the melamine resin precondensate obtained in the melamine resin synthesis has cooled.

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18. The process of claim 16, **characterized** in that the antibacterial additive is admixed after the melamine resin synthesis, the admixing taking place to a melamine resin present in dissolved form as a liquid resin, or, where a solid resin is present, the admixing taking place after the solid resin has been converted into the dissolved form.

19. The process of any one of claims 16 to 18, **characterized** in that the borate salt present in the additive is mixed with the melamine resin together with and/or after and/or before the quaternary ammonium compound.

20. An antibacterial laminate comprising an antibacterial melamine resin of claim 15.

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21. A process for producing an antibacterial laminate of claim 20, **characterized** in that

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a. a dry absorbent sheetlike structure is impregnated with the antibacterial melamine resin present in dissolved form,

5 b. the antibacterial sheetlike structure thus obtained is dried, and

c. the dried antibacterial sheetlike structure is pressed with one or more resin-impregnated interlayers or with a support material, to form a laminate, and is fully cured.

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22. The process of claim 21, **characterized** in that the melamine resin comprises further additives such as, for example, wetting agents or release agents, plasticizers and curing agents and also other customary additions.

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23. The use of an antibacterial laminate of claim 20 for surfaces and floors.